Computer-Assisted Cognitive-Behavior Therapy vs Treatment as Usual for Depression in Primary Care

Jesse H. Wright, M.D., Ph.D., Tracy D. Eells, Ph.D., Jesse J. Owen, Ph.D., Becky Antle, Ph.D., MSSW., Laura Bishop, M.D., Renee Girdler, M.D., Lesley Harris, Ph.D., MSSW., Brent Wright, M.D., M. Jason Wells, M.D., Rangaraj Gopalraj, M.D., Michael Eli Pendleton, M.D.

INTRODUCTION

Computer-assisted cognitive-behavior therapy (CCBT) has goals to improve access, convenience, efficiency, and cost of effective psychotherapy for depression (Thase et al., 2018, 2020 Wright et al., 2019) . There has been a rapid expansion of research on CCBT for depression, and multiple meta-analyses have found evidence for effectiveness of this approach if combined with a modest amount of clinician support (Richards and Richardson, 2012; So et al.2013; Wells et al., 2018; Wright et al., 2019).

This study aimed to test the effectiveness of CCBT for depression in primary care while focusing on dissemination and implementation issues that could possibly effect outcome. Previous research on CCBT has typically recruited and selected patients with internet access and/or interest in participating in online computer-assisted treatment. Thus, there have been questions about the applicability of CCBT for disadvantaged populations. In the current study patients with low levels of reading proficiency and lack of internet access were included.

METHODS

PARTICIPANTS

175 patients from urban and rural primary care practices at the University of Louisville participated in this study. A score of 10 or above on the PHQ-9 was required for participation. Exclusion criteria were: significant suicidal ideation, diagnosis of any psychotic disorder or bipolar disorder, severe medical disorder that would prevent participation, and inability to read English. Patients were randomly assigned to CCBT (N = 95) or treatment as usual (TAU; N = 80). The patients assigned to the TAU condition received standard assessment, clinical care, and referrals by primary care physicians. Antidepressant usage and receipt of other therapies were allowed and not controlled. Patients assigned to CCBT also received TAU.

Eighty-four percent of the patients were female. The mean age was 47 (range 18-87). Fifty-seven percent were white, 25% were black, 8% were multi-ethnic, 2% were Latinx,1% were NA and 7% did not identify their race/ethnicity. 50.3% of patients reported income below $29,999. Seventy-eight patients had commercial insurance, 21 patients had Medicare insurance, 74 patients had Medicaid, and 1 patient had no insurance.

MEASURES

Depression was measured with the Patient Heath Questionaire-9 (PHQ-9; Kroenke et al., 2001), while anxiety was assessed with the Generalized Anxiety Disorder-7 (GAD-7; Spitzer, et al, 2006). The Satisfaction with Life Scale (SWLS) measured quality of life. Assessments were conducted at baseline, after 6 and 12 weeks of treatment, and 3 and 6 months after treatment was completed.

TREATMENT

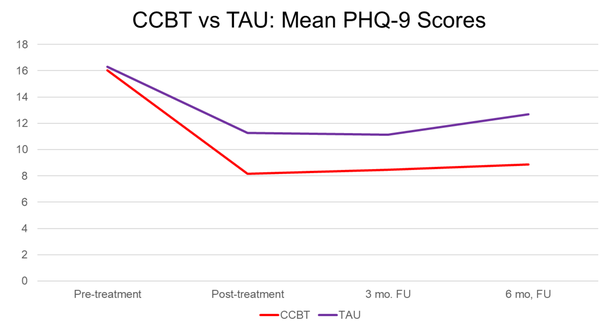
Patients assigned to CCBT used the computer program ***Good Days Ahead*** (GDA) – a 9-lesson, multimedia program that has been shown to be effective in previous research (Wright et al, 2005; Thase et al., 2018). In addition, patients received support from a social worker by phone and/or email for 20 minutes weekly. Persons without internet access were supplied with a low-cost, loaner laptop that was configured to allow completion of online assessments and work with GDA.

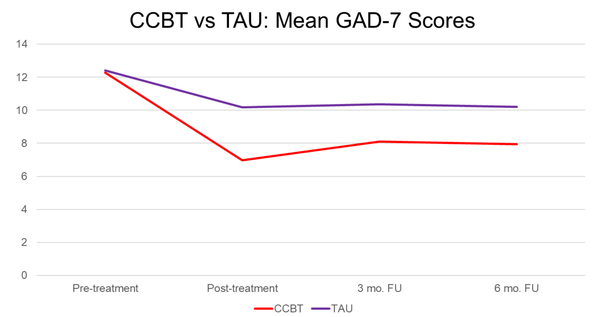
STATISTICAL ANALYSIS

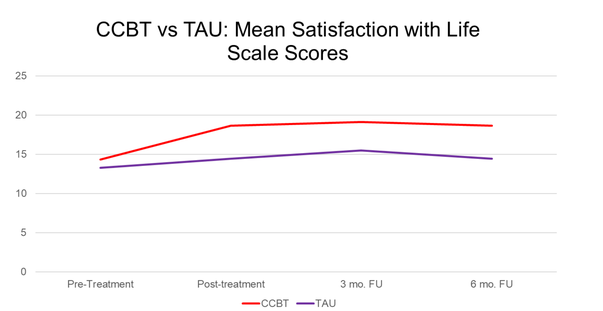
An Intent-to-treat (ITT) analysis was conducted with a series of growth curve models for each of the outcome variables (PHQ, GAD, SWLS). Based on plots of the data, a curvilinear model was developed. More specifically, we specified an intercept (baseline scores), linear change, quadratic change, and treatment condition on those three parameters. To manage missing data, we conducted our analyses with Maximum Likelihood estimation, which is one of several approaches to properly handle missing data (Enders, 2011). Between treatments ITT effect sizes were computed.

RESULTS

No significant differences were found in sociodemographic data, frequency of antidepressant use, or baseline symptom measures between CCBT and TAU (ps ranged from .29 to .88). The study completion rate was 74.7% for CCBT and 70.0% for TAU. Missing data at any time point was not associated with baseline levels of PHQ scores (ps ranged from .06 to .50) or the change in PHQ scores overtime (ps ranged from .30 to .98). Figures 1, 2, and 3 display mean ratings for those that completed symptom measures on the PHQ-9, GAD-7 at each time point.







CCBT vs TAU: Effect Sizes from ITT Analysis

	PHQ-9	GAD-7	SWLS
	Coefficient (SE)	*Coefficient (SE)*	*Coefficient (SE)*
ES (Post-treatment)	0.37 (0.14)**	0.33 (0.13)**	0.39 (0.16)**
ES (3-Month FU)	0.53 (0.17)**	0.46 (0.15)**	0.50 (0.19)**
ES (6-Month FU)	0.52 (0.19)**	0.25 (0.18)	0.49 (0.21)**

*$p < .05$; **$p < .01$; PHQ = Patient Health Questionnaire; GAD = Generalized Anxiety Disorder; SWLS = Satisfaction with Life Scale; ES = Effect size estimated from growth curve models; positive effect sizes favor CCBT

DISCUSSION

In this study in a diverse primary care population, there was significant evidence for the benefit of adding CCBT to usual care. Between treatment effect sizes favored CCBT for all three measures (PHQ-9, GAD-7, and SWLS) at all time points except one—the advantage for CCBT on anxiety scores disappeared at the 6-month follow-up period. Thus we conclude that CCBT can be a valuable addition to standard treatment in primary care patients.

A comparison of effect sizes in our study with those from a recent meta-analyses or CCBT for depression in primary care shows comparable results for clinician-supported treatment. Wells et al., found a mean weighted effect size of g = 0.372 for clinician supported CCBT for depression in primary care. We found an identical mean post-treatment effect size (g = .372) in the ITT analysis for the PHQ-9, while the mean effect size increased to g = 0.52 at the 6-month follow-up indicating durability of positive outcomes for depression. Meta-analyses that included studies in non-primary care populations have found larger effect sizes. For example, Wright, et al (2019) reported mean effect sizes for all clinician supported investigations of g = 0.673. Wright, et al (2019) also found a lower mean effect size (g = 0.224) for all studies of CCBT for depression in primary care.

More research is needed to determine the reasons for lower effects for CCBT in primary care than in other populations, and to find solutions for this disparity. However, it has been suggested that recruitment methods (actual patients vs recruitment by ads and internet announcements), comorbid medical conditions, and less knowledge about how to implement CCBT could contribute to differences in outcomes (Wells et al, 2018). In the current study, inclusion of large numbers of patients with low income and other possible disadvantages may have influenced results. Also TAU in primary care can include many treatments such as antidepressants and psychotherapy that can be useful, thus diminishing the opportunities for an additional treatment such as CCBT to show advantages. Nevertheless, there appears to be sufficient evidence to support use of CCBT as an option for improving treatment of depression in primary care.

REFERENCES

Enders C: Analyzing Longitudinal Data With Missing Values. Rehabil Psychol, 56(4):267-288, doi: 10.1037/a0025579, 2011
Kroenke K, Spitzer RL, and Williams JBW: The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med. Sep 2001;16(9):606-613.
Richards D, Richardson T: Computer-based psychological treatments for depression: A systematic review and meta-analysis. Clin Psychol Rev, 32(4):329–342. doi: 10.1016/j.cpr.2012.02.004. Epub Feb 2012
So M, Yamaguchi S, Hashimoto S, Sado M, Furakawa T, McCrone P: Is computerized CBT really helpful for depression?-A meta-analytic re-evaluation of CCBT for adult depression in terms of clinical implementation and methodological validity. *BMC Psychiatry*, 13:113, doi: 10.1186/1471-244X-13-113, 2013
Spitzer RL, Kroenke K, Williams JB, et al: A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 166(10):1092-1097, 2006
Thase ME, McCrone P, Barrett MS, Eells TD, Wisniewski SR, Balasubramani GK, Brown GK, and Wright JH: Improving Cost-effectiveness and Access to Cognitive Behavior Therapy for Depression: Providing Remote-Ready, Computer-Assisted Psychotherapy in Times of Crisis and Beyond. Psychotherapy and Psychosomatics, 89:307-313, August 2020, doi: 10.1159/000508143, Epub May 12, 2020
Thase ME, Wright JH, Eells TD, et al: Improving the Efficiency of Psychotherapy for Depression: Computer-Assisted Versus Standard CBT. Am J Psychiatry, 175(3):242-250, doi: 10.1176/appi.ajp.2017.17010089, 2018
Wells MJ, Owen JJ, McCray LW, Bishop LB, Eells TD, Brown GK, Richards D, Wright JH: Computer-assisted Cognitive-behavior Therapy for Depression in Primary Care: Systematic Review and Meta-analysis. *Primary Care Companion CNS Disorders*, doi: 10.4088/PCC.17r02196, 20(2):17r02196, PMID: 29570963, March 2018
Wright JH, Mishkind M, Eells TD, Chan SR: Computer-assisted cognitive-behavior therapy and mobile apps for depression and anxiety. Curr Psychiatry Rep, 21(7):62, doi: 10.1007/s11920-019-1031-2, June 27, 2019
Wright JH, Wright AS, Albano AM, et al: Computer-assisted cognitive therapy for depression: maintaining efficacy while reducing therapist time. Am J Psychiatry 162:1158-1164, 2005

UNIVERSITY of DENVER

UNIVERSITY OF LOUISVILLE

C Family Practice, *12*(1), 47. .
ing term conditions in primary care. *BMC family practice*, *12*(1), 10.
without support for depression in primary care: randomised trial. *The British Journal of Psychiatry*, *195*(1), 73-80.
y care. *Health care management review*, *33*(4), 289-299.
t support for depressed primary care patients: randomized controlled trial. *Journal of medical Internet research*, *15*(8), e153.
ults from the PRIM-NET randomized controlled trial. *Cognitive behaviour therapy*, *43*(4), 289-298.

randomised controlled trial. *The British Journal of Psychiatry*, *185*(1), 46-54.
alence rates of disorders and services. *Archives of General Psychiatry*, *50*(2): 85-94.
ed controlled trial with a long-term follow-up. *Cognitive behaviour therapy*, *38*(4), 206-221.